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ABSTRACT

In Iowa, the practice of two-way interactive full motion video instruction is embodied in the use of the Iowa Communication Network (ICN). To facilitate innovative practices in distance education, the preservice component of the Iowa Distance Education Alliance's (IDEA) Teacher Education Alliance provided support for pilot projects which had the following goals: (1) support of Iowa teacher educators in innovative use of the ICN for distance education; (2) creation of activities that expand and enhance teacher education experiences; and (3) contribute to the distance education knowledge base. A workshop was conducted over the ICN to introduce a long-term science, mathematics, and technology education reform initiative. Participants' evaluations are presented. Research reports are provided on projects that included: the preparation of multimedia-based instruction using the ICN, science instruction for students with disabilities, and professional networking opportunities through the ICN. Also included are vision statements by teacher education experts in the fields of foreign language, literacy, mathematics, science, and vocational education that serve as perspectives concerning the application of distance education methods to these disciplines. (AEF)

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Interactive Television Preservice Teacher Education Innovative Applications: A Monograph

Edited by:
Iowa Distance Education Alliance Preservice Teacher Education Committee

Mary Herring, M.S.
Sharon Smaldino, Ph.D.
Ann Thompson, Ph.D.

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Foreward

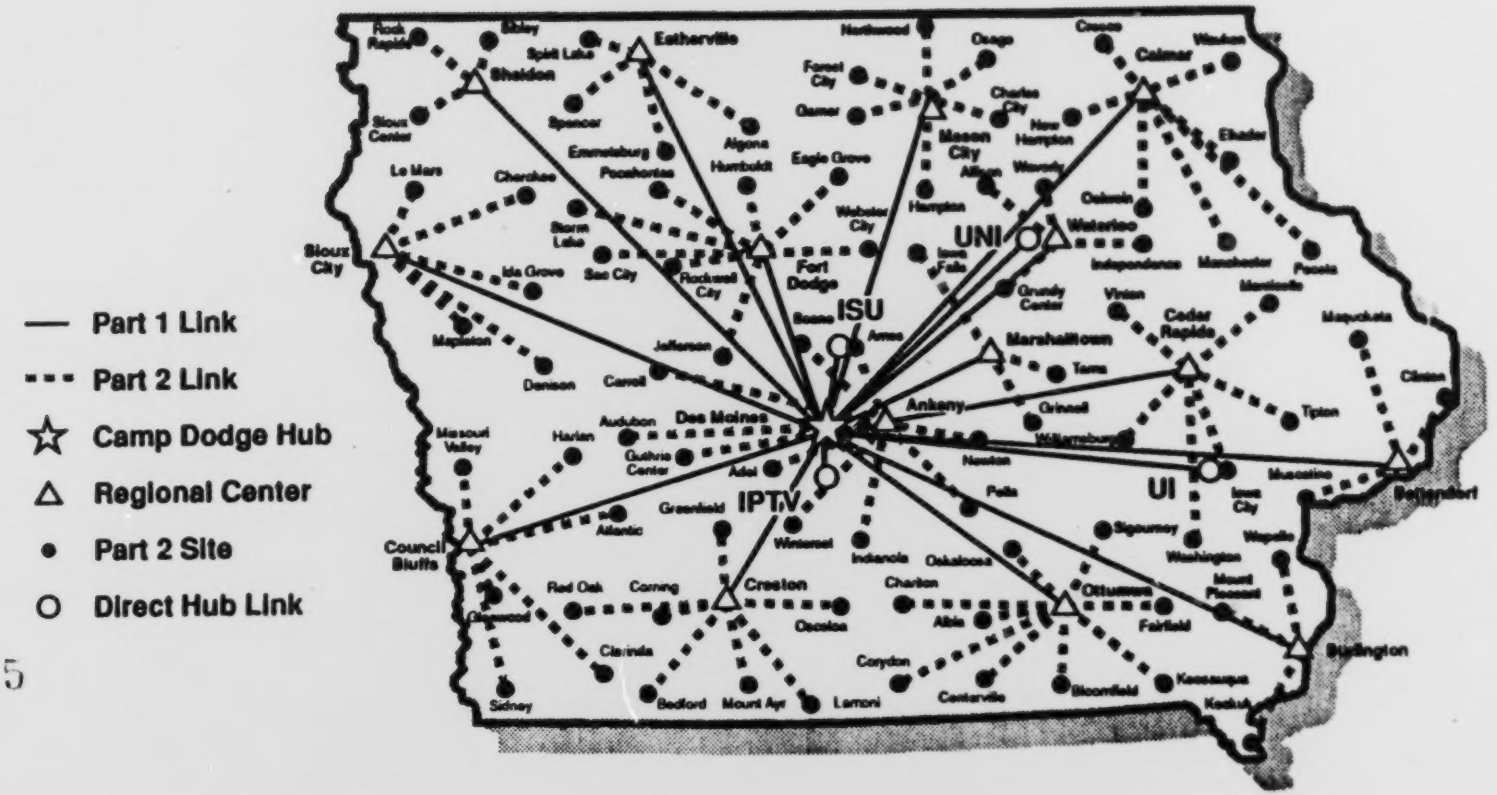
What is Distance Education in Iowa?

Iowa education has established a reputation for its innovation in the area of educational telecommunications. Iowa area community colleges have been delivering instruction over a distance for over twenty years. Based on the success of those programs and looking to the future, the Iowa Legislative Council, in the Fall of 1986, identified that coordination of a statewide network of telecommunications technologies was desirable. A consultant was hired to propose a plan to meet this goal. In 1987, Iowa's General Assembly adopted a three part plan for the Iowa Communications Network (ICN) with the primary emphasis of this plan being the provision of a system based on the needs of the users rather than on the providers of educational telecommunications services.

Part I of the plan provides a major communications backbone to each of the community colleges and the three regent institutions. These sites are linked with Iowa Public Television and the educational network control center by fiber optic technology which provides two-way, full motion video with as many as 48 simultaneous video channels accessible. Part II of the plan provides for the connection the community colleges to sites within their region. In this manner each of Iowa's 99 counties becomes a "point of presence." Part III of the plan provides for the remaining educational institutions to connect to the ICN. Thus, potentially, all Iowa's students will have equal educational opportunities.

Iowa Communications Network (ICN)

Part 1 and Part 2



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How will Distance Learning be implemented in Iowa?

Building the connections served as the first step in the use of telecommunications in Iowa aimed at the improvement of education for all students. Still needed was the construction of classrooms and the training of educators in the use of two-way full motion video. An alliance of educational partners formed to guide Iowa's future in telecommunications. To this end, the alliance developed a plan which included an application for a Star Schools grant. In the fall of 1992 that grant was received and the Iowa Distance Education Alliance (IDEA) became a reality. The purpose of the IDEA was to prepare, support and improve instruction of Iowa educators so they could effectively teach students at a distance and to coordinate the connection of schools to the Iowa Communications Network (ICN). The goals of the project are:

1. Coordinating the use of the system in a systematic manner.
2. Provision of information about the network to Iowans for understanding and acceptance.
3. Preparing and supporting Iowa educators to use the network.
4. Assistance in planning for connection to the ICN and in equipping distance learning classrooms by schools and colleges.
5. Improving and increasing the instruction of mathematics, science, foreign language, literacy skills, and vocational education.
6. Establishing a program of research and evaluation

The basis for this plan was the desire to improve instruction in Iowa through the use of the ICN.

Implementation of distance learning in Iowa is following several avenues.

- The investment of dollars by the state and by the individual points of presence for construction of classrooms for delivery of instruction over the network.
- Inservice workshops and curriculum institutes offered through the Teacher Education Alliance (TEA) of the Star Schools grant to provide training on teaching at a distance.
- Development of resources necessary to support integration of distance education into preservice teacher education.

Preservice Education

In order to facilitate the infusion of distance learning into existing preservice teacher education, a team of teacher educators worked collaboratively on the development of activities directed at providing faculty with the information they need in preparing teacher education majors for facilitating learning in a distance education environment. This collaborative effort reflected the needs and interests of both the public and private colleges and universities throughout the state. The activities included:

- Scheduling Symposia with guest speakers familiar with distance education and teacher education
- Collaborating with teacher educators through the state in the preparation of the Interactive Television Resource Guidebook
- Conducting distance education workshops
- Conducting a series of Methods Faculty Colloquia related to the trends in curriculum reform movements and distance education
- Distributing the D.L.I.T.E. Illuminator newsletter to teacher education facutly in Iowa
- Funding Curriculum/Distance Education Projects
- Preparing a monograph of innovative applicaitons

Preservice Distance Education Infusion Model

Teacher educators concluded that it was mandatory that training in the use of distance learning be given to prospective teachers. This challenge was clearly stated in a publication by the Office of Technology Assessment of the United States congress (1989) when it concluded:

> Teachers must be trained if they are to use distance learning technologies effectively. Training opportunities, however, remain limited. Few preservice and inservice programs focus on how to incorporate technology into instruction, create new opportunities for interactivity, or develop materials and use the media most effectively. (p.88) [Linking for Learning: A New Course for Education]

An additional consideration identifies with the need for preservice teacher educators to model the use of technology. In a survey of media instructors at Iowa teacher preparation institutions, conducted by the Teacher Education Alliance-Preservice Component (1993), it was discovered that teacher education students were not being fully prepared to use distance learning as an instructional technique. The survey results further speak to the need to provide inservice training for educators in Iowa teacher education institutions about the use of distance learning in their own classes.

Therefore it is most realistic to infuse the concepts of distance learning into existing preservice teacher education programs and not require an "add on" component or class in distance learning. The model for infusing distance learning topics into teacher education programs, found in this resource guide, exemplifies this concept. However, this model does, in fact, offer the basic outline for a single course. A sample

matrix offers suggestions for incorporating the model into teacher education programs.

Reynolds (1992) identifies three broad domains of teacher tasks for competent beginning teachers that appear important regardless of subject matter or grade level taught or the teaching/learning model employed. These are (1) preactive (content and materials, methods, and planning), (2) interactive (classroom management, student evaluation, and participation in class), and (3) postactive (direct teaching experience and reflection on teaching experiences). The model for distance teaching in preservice has been developed that parallels these tasks. It is composed of three phases that are referred to as (1) **Introductory**, (2) **Intermediate**, and (3) **Professional**. Each of these phases describe opportunities to infuse distance learning into existing teacher education programs.

Introductory Phase:

The Introductory Phase provides the foundation of knowledge about distance education, its technologies, planning legal aspects, and classroom practice. It would be possible to utilize distance learning in the Introductory Phase of teacher education through: (1) faculty modeling classroom observation techniques, (2) observations of the teacher-to-student and student-to-student interactions in a classroom, and (3) recognition of the grouping strategies and classroom management techniques which classroom teachers utilize. Opportunities might also be given to dialogue with classroom teachers regarding the instructional and classroom management decisions made during a class period.

Intermediate Phase:

The Intermediate Phase provides strategies and techniques for use of the Iowa Communications Network (ICN). Students would learn how to access and operate the system. They will examine the differences between distance teaching and traditional classroom instruction in the preparation of lessons, classroom management, and the grouping of students. Teacher education faculty model the value of distance learning as an instructional tool. Recognized experts might be invited to present from a distance topics such as learning styles, classroom management, and discipline. Presenting micro-teaching lessons on the system help students gain confidence in preparing and teaching lessons at a distance. Multicultural experiences for students can be expanded. In addition, the current literature and research provides a theory base for practice.

Professional Phase:

The Professional Phase provides teacher education faculty and students with experiences on the ICN. Student teaching seminars could be conducted over the system, reducing the amount of time needed for students to travel back to campus. Opportunities to use two-way and three-way evaluation conferences between the student, cooperating teacher, and college supervisor would also be possible. It might also serve as a vehicle for seniors to gain further appreciation of the next phase in their professional development by connecting them to first year teachers. First year teacher seminars could be used to support new professionals in the field.

DISTANCE EDUCATION INFUSION MODEL

INTRODUCTORY PHASE

1.1 Field Experience Preparation
- Modeling observation techniques
- Videotape observation of system use
- Interactivity
- Visualization
- Materials needed
- Classroom management

1.2 Post Session Debriefing

1.3 Interactivity
- Teacher-student relationships
- Student-student relationships
- Grouping strategies

1.4 Learning Environment

1.5 Foundations of Distance Education

1.6 Legal Aspects of Distance Education

1.7 ICN computer/multimedia access

INTERMEDIATE PHASE

2.1 Utilizing the ICN

2.2 Accessing the System

2.3 Trouble Shooting
- Curricular issues
- Mechanical issues

2.4 Current Distance Education Literature/Research

2.5 Planning
- Unit
- Lesson
- Strategies for Interactivity

2.6 Management
- Holding attention
- Grouping of students

2.7 Assessment at a Distance

2.8 Statewide Topic Lessons on the ICN

2.9 ICN Expert Presentations
- Teaching/Learning Issues
- Intercampus Applications

2.10 Multicultural Experience

2.11 Microteaching

PROFESSIONAL PHASE

3.1 Student Teaching Seminar

3.2 Student Presentations to Peers

3.3 Two and Three-way Student Teaching Conferences

3.4 First Year Teaching Seminar

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Conclusion

In short, the opportunities to utilize the Iowa Communication Network system are numerous throughout the entire teacher preparation process. Iowa teacher educators prepare their students to be capable classroom teachers who have knowledge and skills to facilitate learning in an array of educational environments. Distance education is becoming one of those environments that must be acknowledged.

References

Becker, H. (1991). Computers in United States schools: 1989 survey. Journal of Educational Computing Research, 7(40, 407-420.

Brooks, D. & Kopp, T. (1990). Technology and teacher education. In W.R. Houston (ed.) Handbook of research on teacher education. (pp. 498-513). New York: Macmillan.

Reynolds, A. (1992). What is competent beginning teaching? A review of literature. Review of Educational Research, 62(1), 1-35.

Schrum, L. (1991). Teacher education goes on-line. Educational Leadership, 49(3), 39-42.

Praxis

Education is a practical activity; daily, each teacher makes decisions about content and instructional processes for their classrooms. Praxis refers to activity that takes ideas and puts them into practice. Preparing students in the use of distance education provides them with introduction to the nuances of instructional method combined with technological tools; the practice of distance education.

In Iowa, the practice of two-way interactive full motion video instruction is embodied in the use of the Iowa Communication Network. It is important that Iowa's preservice students learn to use the network in effective and innovative ways.

In an effort of facilitate the creation of innovative practices in distance education, the Preservice Component of the Iowa Distance Education Alliance's Teacher Education Alliance provided support for pilot projects which had as their goals:

- support of Iowa teacher educators in innovative use of the ICN for distance education
- creation of activities that expand and enhance teacher education experiences
- contribute to the distance education knowledge base

These projects covered a broad spectrum, from science for students with disabilities, to preparation of multimedia-based instruction using the ICN. The intent of the projects was the enhancement of distance education practice. As a body, the reports present distance educators with a variety of innovative uses of distance education in conjunction with preservice programs.

The researchers' reports are provided in the hope that they will serve as springboards for other distance educators as we continue to expand and improve the preservice teacher education major's distance education experiences.

Using the Iowa Communication Network to Support Teacher Educators: AAAS - Project 2061 Benchmarks

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The University of Northern Iowa (UNI) received a Teacher Education Alliance Star Schools grant to help implement the workshop "Using the Iowa Communication Network to Support Teacher Educators: AAAS - Project 2061 Benchmarks." On March 9, 1994, from 4:00 - 5:30 pm, Mary Ann Brearton, Project 2061 Field Services Coordinator and Carol Muscara, Project 2061 Technology Systems Director, both from the American Association for the Advancement of Science in Washington D.C., were guest speakers over the ICN. They interacted with ICN participants at UNI and nine other sites: Cherokee, Sioux City, LeMars, Ida Grove, Dennison, Mapleton, Johnston, Sheldon and Rockwell City.

The purpose of this workshop over the ICN was to introduce science educators to Project 2061, a long term science, mathematics and technology education reform initiative. A series of documents/tools, namely *Science for All Americans* and *Benchmarks for Scientific Literacy*, developed by Project 2061 of the American Association for the Advancement of Science (AAAS), were the focus of the session.

Science for All Americans (SFAA) defines the science-literate American, describing the knowledge, skills, and attitudes all students should retain from their learning experiences. This tool offers a series of recomendations for reforming our system of education in science, mathematics and technology. SFAA describes

effective teaching and learning through alternative approaches and establishes connections across grades, topics and disciplines to achieve science literacy for all students. The participants were acquainted with this document so the major focus of the presentation was on the newly released tool, *Benchmarks for Science Literacy.*"

Benchmarks for Science Literacy is the second in a family of tools developed by Project 2061 of the AAAS. *Benchmarks* specifies how students should progress toward science literacy, recommending what they should know and be able to do by the end of grades 2, 5, 8 and 12. *Benchmarks* has some unique chapters not found in SFAA: a description of the role of school-district teams in developing *Benchmarks*, definitions of important words, and summaries with citations of the research pertaining to the substance and grade-level placement of benchmarks. The participants were shown both the print and disk versions of this tool for curriculum development.

Participants were given a map of concepts leading to a literacy goal from the section Flow of Matter and Energy. Working in small groups, they identified a K-12 progression of understandings and the interconnectedness of ideas. The mapping of concepts provided a visual representation of where benchmarks come from and how they contribute to more complex understandings. The participants identified experiences that they could provide to help students acquire

the knowledge of the benchmarks at various grade levels. They shared what value conceptual maps might have for curriculum designers and teachers planning instruction.

In summary, Project 2061 has provided two resources for educators that identify what a literate person should know and be able to do and how to achieve these goals. Based upon research and experience of over 150 K-12 teachers, benchmarks were identified and then interdisciplinary conceptual maps were developed. The third tool, a computerized data base called Curriculum Design and Resource System, contains the printed resources, additional research-based items, and conceptual maps based on benchmarks across disciplines.

At the conclusion of the ICN workshop, participants evaluated the session.

Summary of evaluative responses

In response to the statement "Describe 1-3 ideas or pieces of information that you feel was gained through this session," the participants overwhelmingly reported that this particular session gave them a better understanding of "Project 2061" and its purpose. Additionally, many responses related to having an opportunity to be introduced to *Benchmarks*, and how to use it. Other comments indicated that those who were part of this session appreciated making contacts with others around the state, and that they were glad to have an opportunity to see how the fiber optics network is used.

Some of the benefits participants saw from using the fiber optics network (Item 2: "Describe what you feel were some benefits of using the fiber optics classroom for this session.") were largely relating to the opportunity that this afforded them to interact with other educators around the state (a broad audience). One participant termed it a "family concept." Other responses indicated that this gave them the chance to be introduced to the fiber optics system, and to be part of the "cutting edge" in this technology application. It was also noted that this type of outreach allowed access to topics without excessive travel, and that it is more affordable when several sites can share one speaker.

Several drawbacks were noted in response to the statement "Describe what you feel were some drawbacks of using the fiber optics classroom for this session." The greatest drawbacks seen by the participants were that the speaker and many in the audience were not familiar with the system, and that there was some hesitancy on the part of audience members to interact. It was thought that perhaps more practice may help to alleviate this problem. Other drawbacks noted were that there seemed to be much time lost in using the system, such as in switching cameras to different sites, and the monitor was too small. As far as the interaction, many thought that the format made it too formal or impersonal (lack of personal contact), and that the system itself restricted true interactive dialogue due to its inability to include any and all speakers at any one time.

Suggested improvements in general included having additional inservice or follow-up, more time for such an in-depth topic, a desire for distribution of materials ahead of time, and to make videotapes available for playback (or to let particpants know that they are available).

Results of items 4 & 5 in % of those responding:

		Yes	No	N/A
4.	Asking questions	73	23	4
	Hearing the presenter	97	1.5	1.5
	Seeing the presenter	97	1.5	1.5
	Hearing other participants	93	7	
	Seeing other participants	81	19	
	Working with those at your site	97	3	
	Graphics/visuals were easy to see	84	16	
5.	Time and location convenient	100		

Evaluation Form for ICN Classroom Session

Session Title _____

Note: The purpose of this form is to receive constructive feedback from participants. It is not intended as an evaluation of a presenter.

1. Describe 1-3 ideas or pieces of information that you feel was gained through this session.

2. Describe what you feel were some benefits of using the fiber optics classroom for this session.

3. Describe what you feel were some drawbacks of using the fiber optics classroom for this session.

4. Did you feel comfortable with the interactive system?

Asking questions	Yes	No	Not Applicable
Hearing the presenter	Yes	No	Not Applicable
Seeing the presenter	Yes	No	Not Applicable
Hearing other participants	Yes	No	Not Applicable
Seeing other participants	Yes	No	Not Applicable
Working with participants at your site	Yes	No	Not Applicable
Graphics/visuals were easy to read.	Yes	No	Not Applicable

5. Was the time and location convenient for you? Yes No

6. Please make suggestions on how to improve future sessions.

Responses from Evaluation Form for ICN Classroom Session

Session Title _____

Note: The purpose of this form is to receive constructive feedback from participants. It is not intended as an evaluation of a presenter.

1. Describe 1-3 ideas or pieces of information that you feel was gained through this session.

- Hope for future Education.
- Setting student goals with a future objective in mind.
- Utilization of the Benchmarks book.
- Relationship of essays, lists and research sections of Benchmarks
- Understanding more than just hearing "Project 2061".
- I have developed some optimism that it may be possible to generate some consensus on a knowledge base in science.
- Interactive with others across Iowa really neat.
- I appreciated being introduced to the different sections of Benchmarks. Even though I'd looked through the publication before, there were some aspects I didn't catch.

- I feel more comfortable and capable of making good use of the Benchmarks. I better understand the structure of the book.
- I gained a better understanding of the design and usefullness for the Benchmarks for my curriculum work.
- I feel better about the goals of Benchmarks.
- Research very good for understanding student misconceptions.
- RE ICN: Very clear views - both sites and materials plus computer screen.
- RE Benchmarks: Information on research, etc.
- I understand the goals of Project 2061
- I understand the format of Benchmarks
- I know some
- Examining the linkages of the Benchmarks.
- Understanding how the information boxes work.
- The inclusion of research is valuable.
- Heirarchy of Benchmark expectations.
- Description of Project 2061.
- Practice in using Benchmarks.
- Relationship of various parts of Benchmarks.
- Benchmarks is a tool for curriculum development
- Structure of Benchmarks documents.
- Use of Benchmarks documents.
- Availability of disk with more information.

- How Benchmarks connects to the goals in Project 2061.
- How Benchmarks are interconnected.
- The connection between essays and research.
- Explanation of Benchmarks and importance of communication between/among grade levels.
- I am now familiar with the two books and how to use them - this was very helpful.
- Connections between Benchmarks and differentiation of Benchmarks for grade levels.
- I learned a bit on how to use Benchmarks.
- Awareness of the project 2061...Benchmarks! Learning how to use the Benchmarks text to our advantage.
- Look down the road to see where the goal is and describe the process of how students will get there. I appreciate the detail at specific grade levels.
- The program really made me aware as to what this program is about. I can't wait to get the Benchmarks book to aid in my curriculum and lesson plans.
- The structure of the Benchmarks book.
- I learned what the project was about (previously I had no idea). I saw Dr. Tony Heiting.
- What Benchmarks are about and how to use the book to some extent.
- I like the concept change ideas.

- Basic understanding of the book and interconnection of ideas (benchmarks).
- Students don't necessarily connect all the knowledge fragments. We really need to emphasize the connections.
- I was impressed by the heavy ecological emphasis in the benchmarks.
- Misconceptions are hard to change.
- K-2 people need to be sure to include key science concepts in their curriculum.
- How to participate in fiber optics.
- I most appreciated the research of student understandings and misconceptions.
- Making connections between grade levels of different ideas.
- Breakdown of format.
- Connectedness of the different parts.
- Application - apply the text to develop appropriate curriculum.
- Making connections between K-12.
- Sorting and organizing curriculum.
- What exactly Project 2061 is and how it is used.
- Using Benchmarks with essays/research.
- Progressions of benchmarks.
- Just to be more knowledgeable of the system - and the book Benchmarks.

•I learned a little about Project 2061 and what a benchmark is.

•Many of the benchmarks are not totally new. I will do more reading because of this session.

•Importance of curriculum planning K-12 really stands out.

•I like the thought of not being able to tell them what they need to know.

•To make connections - See where you're going.

•Building blocks - K-12 cooperation.

•The essays are good to use as well as the research.

•I did not know much about 2061. Why it has this name and what it is trying to accomplish.

•Background of Benchmarks for Science Literacy.

•Experience fiber optics as work.

•Associations with Benchmarks. Knowledge of Project 2061.

•Overview of Project 2061.

•Material pickup.

•A discussion of the use of the essays and the lists.

•What the Benchmarks are and how to use them.

•That the Benchmarks can serve as a guide to determine outcomes in the classroom.

•Background and information on Benchmarks.

•Ways to use Benchmarks.

•Essence of Project 2061 - 4 items: a) list, b) essays, c) x reference, d) research.

- Further understand Project 2061.
- Benchmark information.
- Familiarity with Benchmarks. Its usefulness and it interested me in going through it all, at least at my grade level.
- Pointed out the four main parts of Benchmarks: Lists, Essays, Research, & Boxes.
- Features and uses of the book.
- Important information on prerequisites for grades.
- Introduction.
- How the books fit together.
- Use of the printed materials that we received.
- Knowledge of materials.
- Different approach to science ideas.
- Research based materials.
- Found out what Benchmarks for Science was.

2. Describe what you feel were some benefits of using the fiber optics classroom for this session.
   - The interaction of concerned educators throughout the state provides a greater melting pot of ideas.
   - Allowed many parts of the state to be involved in the session.
   - Involving many areas of state in workshop
   - Gaining information and feedback from other sites where teaching methods and ideas may be different.

- We were able to reach a broad audience.
- Exchange of information was comfortable.
- Decrease problems of travel. Reach lots of people in lots of areas of the state at once.
- Can reach a wider audience.
- It not only reached, but connected teachers from across the state of Iowa.
- I loved realizing that teachers across the state were joining with me to concentrate on improving the "state" of science teaching in Iowa.
- Getting input from other sites.
- Introducing people to system.
- Interaction with other schools.
- Did get input from various sites.
- Many from around the state benefited.
- Hearing from teachers across the state without leaving home.
- The ability to reach more state areas without travel.
- Affirmation of reactions/responses from different locations, very similar reactions.
- Many areas in state could receive information from one presenter.
- People at distant locations could be involved.
- A good way to share resource personnel across the state.

- I appreciate the modeling of using the fiber optic system.
- One benefit was being able to hear the presentation in a local setting. Having the material explained and working through them with the instructor was valuable.
- It allowed a lot of us to meet at one time - it was convenient.
- A lot of people were able to get together and not have to travel so far.
- Connected to many opinions.
- Many could experience at once.
- Sharing of ideas among teachers of all ages and discipline.
- I felt I was the cutting edge.
- Allows for a wide range of input.
- Share ideas with wider ranges of individuals. Reduces travel time involvement. Much appreciated.
- Not having to travel a long distance to interact with a large variety of teachers.
- Were able to see many other people and sites access to the speaker.
- Great way to inform many at different locals with minimal travel.
- Extremely beneficial and inexpensive to learn and give feedback.
- Helped bring a lot of people together.
- Family concept.

•Getting the latest information without the expense and time of travel.

•Sharing of information and ideas

•Availability of Classroom

•Be able to hear known speakers locally

•Exchange of ideas between several other people.

•I like the interactive ability between sites.

•Get ideas from other people at other sites

•Interaction with so many others all at the same time.

•Many people allowed to interact.

•Share "expert" knowledge from all sites.

•Convenience of information without driving far.

•Being able to interact with teachers from other districts.

•Being able to bring session to this area that otherwise wouldn't be able to see.

•Hear opinions from many participants.

•Interaction/input from many different areas around the state is always helpful.

•Making presentations more affordable. Enable you to see speakers not normally available.

•Lots of ideas.

•Many people across Iowa were able to participate.

•Ability to converse with discussion leader during session. Saving travel time traveling distances to hear speakers.

•The opportunity to be introduced to the information at hand.

•Travel time is a plus.

•The instructor has the ability to be more than one place. Travel time and accommodations relieved.

•We were able to participate without traveling long distances - losing the time used to travel.

•Comparison to microwave - fine.

•I didn't have to drive very far.

•Can reach many more teachers using this system.

•Can make the information available to a wide and diverse group of teachers throughout the state.

•Able to see each other in remote sites.

•Able to use the network to see other applications.

•Good way to collect and share information effectively.

•Interaction was good.

•Further communication and better understanding.

•A way of getting in touch with an expert on the subject.

•Hearing a speaker we wouldn't have been able to otherwise.

•Able to interact with others and get more opinions right away.

•People from across the state can participate in the same activity.

•Various input from other centers.

•Having "experts" with us in real life to include in our

discussion.

•Feedback and the feeling of participation.

•We were able to see and hear someone we could not have met without the system.

•Interaction.

•The ability to hear the information directly from the presenter.

3. Describe what you feel were some drawbacks of using the fiber optics classroom for this session.

•It took time away from the presentation.

•It may have caused some people to hold back.

•Distribution of materials.

•Formality of instruction.

•Not everyone is familiar with the technology so some problems arose.

•Interaction was 2-way teacher-student. Lack of good interactive dialog.

•Feedback slow - took more time.

•responses were slow. Took extra waiting time that could have been spent in discussion/presentation

•Time limited to only 90 minutes. Jo was right! You need 3 days!

•Getting acquainted with the system takes awhile.

•Lack of person to person contact.

•Some time problems due to those unfamiliar with the microphones.

•Some confusion among all participants.

•No way for participants to indicate interest in contributing and for teacher to select. Feel you are interrupting. Hard for teacher to select display from site.

•None.

•Noise level

•The time restraints did not allow in depth discussion. Hesitancy (time wasted) of people to interact with the system.

•The audio from remote locations was too loud.

•Same problems of student teacher interaction as is presented in a large lecture hall

•If I were the leader it would drive me crazy to coordinate the button pushing and presenting. It does seen a little slower than a single live session.

•This was a rather large group of sites and I don't feel the people felt as free to interact as they would have in a smaller selection.

•The presenter didn't seem to feel comfortable - she had a hard time making her point due to the uncomfortable feeling she had.

•A hurried atmosphere.

- Not as spontaneous and not enough time.
- Overplanned
- Presenter felt a bit uncomfortable with the format at times.
- Until familiarizing is gained, somewhat intimidating.
- Not being comfortable with system yet.
- No books, impersonal and hare to cohere answer/interaction.
- Inhibition to speak and I don't like not having a teacher in the room.
- Too many people to interact with and too short of time.
- People were a bit hesitant to interact.
- We were a little awkward with it, but we will get better with practice.
- Not all people had the necessary materials.
- Everyone was still learning - a bit disorganized.
- Still getting used to systems - everyone still a bit self-conscious and nervous.
- Not enough time.
- Some difficulty in using equipment.
- Time.
- "New" technology
- I like the face-to-face - but this is a viable alternative.
- Downtime from center to center. Need to be more familiar with equipment.
- Uneasy with using microphones - interactions and sharing of

ideas - slow

•Could use more time

•Many are still uncomfortable/intimidated with the system - therefore don't participate.

•Sites were slow to respond.

•Presenter wasn't familiar with the system. Lost discussion time because of not being familiar.

•Somebody should push the buttons for the lady so things go smoother.

•Time with the presenter. Given one and one-half hours of time is very limiting with the information given.

•Time constraints - Participation when so many groups are involved.

•Feel disassociated with instructor.

•Equipment was confusing for facilitator.

•Lack of teacher contact.

•Unfamiliar with techniques at first slowed up the process.

•The technical aspects took some time to bounce around during discussions, but it was pretty efficient.

•Monitor was too small.

•Probably feeling less obligation to participate.

•Couldn't identify the speakers.

•Time.

•Teacher was a little unfamiliar with the equipment - had

some "silent times".

•Time limitations - amount of material in such a short time.

4. Did you feel comfortable with the interactive system?

Asking questions	54 Yes	17 No	3 NotApplicable
Hearing the presenter	74 Yes	1 No	1 Not Applicable
Seeing the presenter	74 Yes	1 No	1 Not Applicable
Hearing other participants	71 Yes	5 No	
Seeing other participants	60 Yes	14 No	
Working with participants at your site	72 Yes	2 No	
Graphics/visuals were easy to read.	57 Yes	11 No	

5. Was the time and location convenient for you? 74 Yes 0 No

6. Please make suggestions on how to improve future sessions.

•Possibly give some information, as far as topics, out in advance in order to generate discussion.

•Continued practicums with the book.

•Additional inservice will be valuable.

•Need to engage in more examples of using the materials.

•Well done.

•Great to see computer integration use with the interactive video.

•Make it longer.

•More time - not enough time.

•We need to have materials before the meeting.

•Have materials available.

•When someone pushes the button to talk the monitor should go there automatically.

•Just keep trying and experimenting.

•Need more time.

•Followed-up with further interactions. Very good! Thanks for the opportunity.

•Possibly assigning a person to respond from each site.

•Calling on sites and expecting responses may speed things up.

•Thanks for organizing this, I appreciate the opportunity to learn.

•Fiber optics worked well. I was very confused with the direction and material presented in the discussion.

•Can these be taped and the tapes made available?

•I would like more input into 2061 and learn how to use it in our local school and in my classroom.

•Information on the Benchmarks given to the teachers before hand to look over would help.

- Have materials given out previously so the interactions can come about more fluidly.
- It might be helpful to have the materials ahead of time.
- Too much material for such a short time.
- Very Good!

Pre-service Teachers Use Authentic Assessment in the ICN Distance Education Classroom: A Feasibility Study of the Computer-Based Observational Assessment Tool

Final Report

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Pre-service Teachers Use Authentic Assessment in the ICN Distance Education Classroom: A Feasibility Study of the Computer-Based Observational Assessment Tool

We tested the feasibility of using the Computer-Based Observational Assessment Tool (CBOAT) for distance education at both the origination and receive site to facilitate data collection for teacher self-evaluation and authentic assessment of learners. Specifically, we were interested in determining if it was feasible for the family and consumer sciences preservice teacher to use the CBOAT while teaching on the distance education system, and if it was feasible for the receive site facilitator to use the CBOAT while performing other responsibilities during lesson transmission. An additional goal was to determine whether the CBOAT is an appropriate assessment tool for managing authentic assessment procedures within the distance education classroom.

The CBOAT we used with the study was called Learner Profile from Sunburst/Wings. The equipment option we obtained included a time wand, Macintosh computer software, and a docking system. The time wand is a credit-card sized bar code reader which is capable of storing data. A sheet of appropriate bar codes is created and printed through the computer software (See Appendix A – Bar Code Sheet), and the time wand is used to scan selected bar codes on the sheet that allows the user to systematically store assessment data. The docking system is

used to transfer data from the time wand to a computer, and to recharge the batteries in the time wand. The Learner Profile software provides a means to manage data sets for all students, multiple course sections, and many teachers in one building. Summary reports can be obtained for individual student records or their portfolios, course records, teacher records or building records.

We tested and assessed the use of the CBOAT time wand tool for interactive teleteaching with preservice Family and Consumer Sciences Education and Studies (FCEdS) teacher education students during Spring 1994. In addition, we used the CBOAT in an informal way during the distance education transmission of the Vocational Education Curriculum Institute during Summer 1994.

Procedures

We obtained the CBOAT tool in April, 1994. The pre-service teachers who tested the CBOAT were students enrolled in FCEdS 403 (Evaluation for Vocational Home Economics) and FCEdS 413 (Curriculum Planning for Family Life and Vocational Home Economics). The two courses are taken concurrently so the same students were in each course. Students in the FCEdS 403 class identified three observation categories and the qualifiers to use with each observation category. For the next two class sessions, students

practiced using the time wand (CBOAT) with the prepared bar code sheet so that their scanning movements would become more automatic for achieving a beep signal to indicate a successful scan.

In FCEdS 413 students planned and implemented two lessons as a part of this study. The first lesson utilized the distance education fiber optic classroom with fellow students and faculty as the audience in both the origination and receive sites. The second lesson was in a conventional classroom with middle school level students as the audience. Because of the late date in obtaining the CBOAT tool, there was little time in the two courses to develop a mind set about observing learner performance, what criteria to use, or to practice teaching and observational skills before putting them all together in a mini-lesson.

We developed two parallel instruments to obtain participants' perceptions regarding the use of the CBOAT in distance education lessons (See Appendix B– Comment Sheet). The parallel instruments were used to collect comments from facilitators and teachers. The comment sheets were returned at the next class session. Then we compiled the responses on the comment sheets from all participants.

In addition to the Spring 1994 study, during the summer teachers enrolled as graduate students in the Star Schools Institute for Vocational Educators who were located at the Boone distance

education classroom used the CBOAT in a similar manner that used by pre-service teachers discussed above. They used a bar code scan sheet which included three observation categories and one criterion set (See Appendix C – Boone Scan Sheet) to collect data on performance of Boone site learners. They used the scan sheet in the role of teacher when teaching the lesson and then used the scan sheet in the role of the remote site facilitator when lessons were received from the and Emmetsburg sites. No instrument was used with this group to collect written participant perceptions. However, the participants offered several informal comments which were noted.

Results

PreService Teachers in FCEdS Methods Classes

Transcripts of evaluation comments from preservice teachers in the roles of facilitators and teachers are found in Appendix D – Compiled Evaluations.

A summary of facilitator comments indicated that the CBOAT was useful in taking attendance, recording behaviors and tracking student progress. They recognized that only predetermined observations or criteria could be noted, and felt that this data could be recorded by the facilitator for all students at both sites.

Difficulties in using the CBOAT were related to classroom interruptions and the need to practice in order to perform a successful scan.

When presenting lessons, teachers saw the CBOAT as a tool for recording attendance and notations regarding classroom management. While in the teacher role, several expressed concern over difficulties in using the CBOAT while simultaneously conducting the lesson. The need for practice in using the time wand before bringing it into the classroom was also indicated.

Teachers at Summer Star Schools Institute

Two teachers were positioned on opposite sides of the room, each with a CBOAT tool and scan sheet. During the day, four sets of two teachers participated for a total of eight teachers using the CBOAT tool to scan observations. On average, teachers scanned an observation about once each minute. For the three lessons observed, the length in minutes and number of scans is listed below.

Lesson Observed	No. of scans	Time in minutes	Average scans per minute
Lesson 1	40	45	0.89
Lesson 2	25	32	0.78
Lesson 3	51	57	0.89

One data listing available from downloading information off the time scan into the Learner Profile program is a list of observations each with the corresponding time of day noted. This timeclock coded information can be extremely helpful for teachers who wish to review the class agenda. A student who is tardy to class can be noted with the exact time of entry into the classroom with a simple scan. Alternatively, accurate data on students in a lab situation where certain tasks should be accomplished within specified deadlines can be maintained.

Oral comments made by Institute teachers indicated that the facilitator could record
nearly continuous observations of anticipated student behaviors. They believed the tool was very useful in a distance learning environment. However, teachers did express concerns that the remote site facilitator needed to be a trained educator who had an evaluation philosophy congruent with the teacher. These teachers also felt strongly that the CBOAT should be available for use at both the origination and remote

sites, but that its use be left to the discretion of the origination site teacher.

Dissemination

Results of this feasibility study are being disseminated in several ways. General impressions obtained from pre-service teachers during Spring term were shared with current teachers at the summer institute. Institute participants reviewed results of the study and considered their own level of support for recommending inclusion of the CBOAT as standard ICN classroom equipment. In addition, a discussion of the project and a demonstration of the CBOAT device was made to the following professional groups:

Home Economics Teachers Update: Current Topics in Foods & Nutrition (June, 1994). *Techn Tools for Nutrition: Secondary School Software.* Sponsored by College of Family and Consumer Sciences and Des Moines Public Schools Home Economics Department

Technology of Tomorrow–It's Here Today(June, 1994). American Home Economics Association, San Diego.

Scanning to the Beep: Assessment in the Palm of Your Hand, accepted for presentation October, 1994. Iowa Curriculum and Instruction Conference, Ames.

References

Bruder, I. (January, 1993) Alternative assessment: Putting technology to the test. Electronic Learning. p.22-28.

Dede, C. (1990) The evolution of distance learning: Technology-mediated interactive learning. Journal of Research on Computing in Education, 22(3), 247-264.

Epstein, S. (1994). Electronic Teaching Assistant. Institute for Academic Technology, Chapel Hill, North Carolina.

Foran, James, David Pucel, Rosemary Fruehling, and Janice Johnson. (1992). Effective Curriculum Planning. Paradigm Publishing Int..

Hart, Diane. (1994). Authentic Assessment: A Handbook for Educators. Addison-Wesley. Publ. Co,

Iowa Department of Education. (1992). A New Vision for Vocational-Technical Education in Iowa. February.

Iowa Department of Education. (1989). Highlights of S.F. 449. September.

Iowa Department of Education. (1993). Program Management Guides for Vocational Education. (Draft copies). August.

Sunburst Communications, Inc. (1994) Learner Profile: A tool for authentic assessment. Everett, WA: Results Based Systems Corp, Authentic Assessment Institute.

Wilcox, John. (1991). "The Perkins Act." Vocational Education Journal. February pp. 16-17.

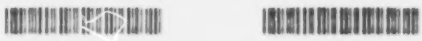
Appendix A – Bar Code Sheet

Students: FCEDS 413

Observation Set: Micro teaching

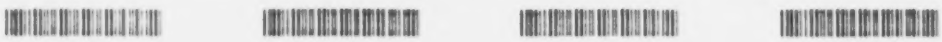
asks about words or ideas not understood | listens attentively | relates consequences to actions

Qualifier Set: Y/N



Yes | No

Special



Present | Absent | Tardy | Delete

Students: Voc Ed Institute

AA	BB	CC	DD
EE	FF	GG	HH
II	JJ	KK	LL
MM	NN	OO	PP
QQ	RR	SS	TT

Observation Set: INSTITUTE 1994

Is attentive to presentation	Participates in group	Uses microphone each time makes a comment	Willingly informs teacher if transmission not effective

Qualifier Set: Y/N

Yes	No

Special

Present	Absent	Tardy	Delete

Appendix B– Comment Sheet

Feasibility of using the CBOAT while teaching on the Distance Education Network

Your reactions to using the Computer Based Observational Assessment Tool (CBOAT) during the presentation of a lesson on the ICN distance education network are important! Educators in Iowa are exploring effective ways to implement distance education, and your experiences will be helpful as they make recommendations for resources and equipment to facilitate instruction.

Please take a few minutes to describe your reactions to the following. If you need more space, feel free to use the back side of the paper.

1. In what ways would you use the CBOAT wand while teaching on the system?

2. What difficulties, if any, did you encounter as you used the CBOAT during your teaching experience?

Feasibility of using the CBOAT while also working as the Remote Site Facilitator
on the Distance Education Network

Your reactions to using the Computer Based Observational Assessment Tool (CBOAT) during the transmission of a lesson on the ICN distance education network are important! Educators in Iowa are exploring effective ways to implement distance education, and your experiences will be helpful as they make recommendations for resources and equipment to facilitate this instructional delivery system.

Please take a few minutes to describe your reactions to the following. If you need more space, feel free to use the back side of the paper.

1. In what ways could you use the CBOAT wand while facilitating the lesson transmission on the system?

2. What difficulties, if any, did you encounter is using the CBOAT while performing your other responsibilities as the remote site facilitator?

Appendix C – Boone Scan Sheet

Students: 403 Evaluation

Lana Hughes

Laura Huss

Lynn Blakesley

Marcy Bertran

Rhonda Chittenden

Sara Lohman

Stacy Scarlett

Observation Set: distance ed trial

Interupts teacher when needs to seek clarification

Listens attentively

Tries more than once before requesting assistance

Qualifier Set: Y/N

Yes

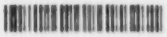
No

Special

Present

Absent

Tardy


Delete

Appendix D – Compiled Evaluations

Facilitator Comments

1. In what ways could you use the CBOAT wand while facilitating the lesson transmission on the system?

S1 I could use it easily to record attendance, to record planned observations with qualifiers. Suggest a few open student name spots, Visitor 1, Visitor 2. Suggest a time mark spot if changing activity.

S2 I used it to record predetermined observational set and attendance. I use it to record student behaviors that contributed to the lesson.

S3 (No comment)

S4 Helping teacher keep track of students' progress

S5 The facilitator could take the attendance, monitor student behavior and record observations using the CBOAT much easier than the instructor. The facilitator could view the distance students in the monitor as well as the students in the room.

2. What difficulties, if any, did you encounter is using the CBOAT while performing your other responsibilities as the remote site facilitator?

S1 None because I knew the names, and seat locations of the students, it was easy to use

S2 Interruptions/people took me away from my task of scanning. Helping learners with manipulatives in my site distracted me from scanning. I wanted to record behaviors in retrospect, immediately after the lesson.

S3 45 degree angle was difficult – getting the correct pressure too. Because the beep is audible – students knew I was evaluating and caused some discussion (had not practiced scanning earlier)

S4 This is easier to utilize when you are the facilitator rather than the teacher.

S5 I do not see any difficulties in using the CBOAT as a facilitator. Except if the students are not visible on the monitor

Teacher Comments

1. In what ways would you use the CBOAT wand while teaching on the system?

S5 Unless I was very familiar with the ICN system and was instructing using a lecture approach I would probably not use the CBOAT. Teaching a manipulative lesson and using the ICN system does not leave much time for the CBOAT. I also was not able to glance at the screen and make a judgment as to whether a student was on task. I think this was because the monitored picture was fuzzy. I would not use the CBOAT.

S6 I would use it to take attendance, check on attentiveness, check on competencies, etc.

S4 To keep track of students' progress and attendance, etc.

S7 If I wanted to observe performance of the students as far as if they were disruptive.

2. What difficulties, if any, did you encounter as you used the CBOAT during your teaching experience?

S5 Too many other things to think about, see above

S6 I feel it was uncomfortable to use, as I've never used it before and I don't believe I utilized it as I should have.

S4 It was very hard to demonstrate my lesson, watch the students at my site, watch the students on the monitor, and use the CBOAT. It was **difficult.**

S7 Many. I can't measure performance of everyone because I couldn't see them clearly. It would take too long to have all of them come to the camera so I could see. I think you need to be more attentive while on the system and using the CBOAT takes away from that.

Oral comments made in classroom discussion

They all agreed that the hand held device needed to be redesigned in the shape of a pen or straight wand. They wanted clarification on the observational set criteria or the parameters of the observational set. They wanted the freedom to change the criterion points after experience with scanning.

What happens to a left-handed individual with this design of scanner???
One teacher was left handed and reported no problems.

They wanted the liberty to interpret criteria liberally. They wanted the observations to include overt responses in the classroom. Does respond (for example)

Wanted to have an observation on disruptive or unsafe posture. Want to include classroom (discipline) management behaviors or social skills in observational sets.

Teachers could confer with facilitator over the network at the beginning of the session describing in more detail the meanings attached to each criterion in the observational set.

Preservice Teacher Preparation of Multimedia Instructional Materials for Use on the ICN

Final Report

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Chair, Education Department
Cole College
Cedar Rapids, IA

Project Purpose and Goals

The purpose of this project was to provide introductory experiences for preservice teachers in 1) preparation of multimedia based instruction and 2) delivery of instruction using the ICN. A closely related goal was that preservice teachers at Coe College would develop both awareness of the potential for distance education and comfort in using two important emerging educational technologies--computer based multimedia and the Iowa Communications Network.

Contributions of the Project to Distance Education in Teacher Education

We have considerable evidence that teachers teach the way they were taught. Almost none of the prospective teachers in our teacher education program at Coe have had personal experience with distance learning. It is quite likely that students in other teacher education programs are similarly inexperienced. In addition to the lack of familiarity with this technology, many future teachers express a general fear of all technology. Simply telling students about the opportunities and need for teachers trained to work in distance education does nothing to reduce their fears of using this approach. It is obvious that building skill and inclination to teach using the ICN or related systems will depend on providing opportunities for prospective teachers to use the system personally.

There is considerable danger associated with the "talking heads" approach to instructional delivery on a two-way audio/video system. Emerging technologies in multimedia based instruction offer considerable potential for enlivening presentations on the ICN. The Teacher Education Alliance conference in Des Moines (February 3ñ4, 1994) demonstrated understanding of this concern by including the

session, "Visual Presentations with Pizzazz." Due to time constraints, this session was limited to using the computer to generate title screens and still images for use in instruction.

Multimedia presentation programs--which offer greatly enhanced capabilities for sequencing not only such still images, but also a wide variety of graphic images, photographs, images captured from a video camera, music and sounds, and animations--are coming onto the market now. These packages have been most effectively exploited by (and targeted to) business audiences. Educational uses are much less well developed, but the potential for such use is very high.

The value of this project was in linking these two important emerging technologies--the ICN and multimedia presentations--to stimulate the creativity of future teachers. The non-threatening nature of the project allowed a significant group of future teachers to experience using the ICN first hand. It is hoped that their positive experience will be shared with fellow students in the programs at the participating colleges.

Project Details

Fifty students in two sections of EDU-205, Educational Foundations, at Coe college were the primary participants. They were given preliminary instruction in the use of multimedia software. Work was completed on a Compaq ProLinea 4/33 (IBM compatible) microcomputer equipped with a CD-ROM drive and a Sound Blaster-16 sound card. In addition, project funds allowed the purchase and installation of two important pieces of hardware: The Presenter Plus Sound and The Presenter Video Capture. The Presenter allowed the students' multimedia presentations to be output to a VCR for use on the ICN. The Presenter Video Capture allows images from a video camera to be imported to the computer for use in presentations.

Two software packages for creating multimedia presentations were available. These were Super Show and Tell from Ask Me Multimedia, and Compel from Asymetrix. Super Show and Tell is considerably easier to use and was chosen by all student groups. Images and music used by students in their presentations came primarily from The Best of Media Clips (Aris Media).

Students at Coe worked in groups of 4 to 6 students. They were asked to prepare a 20 minute presentation which could be given in class and, potentially, delivered on the ICN. As part of their instruction, they were expected to include a short multimedia presentation which they created to supplement their message.

Faculty from Wartburg College and Central College agreed to participate via the ICN. The requirement to complete this grant prior to September 1, 1994 dictated that the network demonstration session be scheduled by mid-May when the three participating colleges ended classes. Serious scheduling problems resulted. Only one ICN session could be arranged. This was held on May 16 at 3:30 pm. This was during final exam week at Coe and attendance could not be required due to many time conflicts. The same was true at the other two colleges. Twelve (12) Coe students, four (4) Wartburg students and sixteen (16) Central students participated. One faculty member at each institution was also involved. Participation at Wartburg was lower than it might have been due to the fact that students and faculty were involved in "May Term," which involves many in special projects and off-campus study. Many Coe students who wished to be involved in the ICN session were unable to participate because of scheduling difficulty. Since we do not have an ICN classroom on campus, those who did participate had to travel approximately 20 minutes to

Kirkwood Community College. An on-campus ICN classroom, like that available at Central, is a considerable resource.

The ICN session was the highlight of the project. The session consisted of a brief introduction, demonstration of videotaped multimedia presentations, and a question and answer-discussion period. The videotape included one sample multimedia presentation prepared by Professor Johanson and four representative student presentations. Coe students discussed their experiences creating the multimedia projects, problems they encountered, the process of incorporating the presentations into their instruction and their assessment of the usefulness of multimedia for teaching. All students were asked to comment on whether they believed the multimedia was a valuable addition to distance learning.

Evaluation

It was only possible to do anecdotal evaluation of this project. The time constraints of the grant meant that we could not schedule grant activities at a time when we could assure a high rate of return of evaluation instruments. Furthermore, this was a demonstration project. Successful evaluation, therefore consists in having completed the demonstration.

Students at all three sites expressed considerable interest in the multimedia presentations. Their comments consistently supported this project's contention that multimedia can be a useful adjunct to distance learning. Remarkably attention-getting presentations were created by novice students using the software and hardware provided. None of the Coe students had previous experience with distance learning. All commented that they had enjoyed the experience and would be willing to learn more about teaching at a distance.

It should be noted here that while the software used is relatively user-friendly, hardware problems were encountered. The installation of the Presenter Plus Sound card caused problems with the Windows sound drivers. This is probably not a project to be recommended to the technologically fainthearted. Coe's computer support staff was regularly called upon to help resolve problems of driver incompatibility which seemed to arise often. Multimedia is in its infancy, however, and it can reasonably be hoped that within several years much greater standardization will have occurred and fewer hardware problems will be encountered.

Anticipated Follow-up

During Fall Semester, 1994, students at Coe will again prepare multimedia presentations. We would welcome the opportunity to have a multi-site ICN session to share these again. At the fall meeting of the Iowa Association of Colleges of Teacher Education, Professor Johanson will briefly describe this project to faculty from other teacher education programs across the state. Copies of this final report will be made available to all interested individuals.

TEACHING SCIENCE TO PERSONS WITH DISABILITIES

Final Report

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INTRODUCTION

An examination of mission statements of schools in the United States, will reveal "Quality with Equity," to be a very common statement. However, many teachers have a view that equal treatment is fair treatment. A utilitarian view, what is best for the majority is best for everyone, is often a permeating orientation in the classroom. The breaking of this belief system, along with providing beginning teachers with the skills to differentiate instruction to accommodate individual differences, is essential if we are to have unified schools for all students.

Too often, the student with disabilities does not receive special consideration for his/her unique learning needs in the context of the academic disciplines. An accumulation of lowered expectations, more limited hands-on experiences in science laboratories, and more limited life experiences often results in inadequate preparation and an inability to cope with the academic expectations in science related fields at a college or university. An inclusive school framework, with special assistance within the setting of a regular classroom, strongly supports a transdisciplinary approach. Collaboration with other educators and related service personnel is a responsibility for all teachers of science to meet the academic, social, and physical needs of students with disabilities. Programs for science teachers must include specific training in these responsibilities.

Teachers who realize the true nature of teaching and learning, who can motivate and stimulate learners from the gifted to those afflicted with apathy

and disinterest, are essential resources if we are to prepare our students to meet the demands of the 21st century. Effective citizens feel a sense of productivity, importance and appreciation. Our schools must prepare all students for a fulfilling and productive life including those entering colleges, those best suited for technical training, and those who wish to immediately enter the workplace. New teachers faced with the responsibility of becoming instructional leaders in classrooms have unique needs. Their teaching must be nurtured by providing continuing direction to develop their competence, performance and effectiveness. Science teachers have had little or no exposure to accommodating instruction to allow maximum participation of students with disabilities.

How responsible are we as teacher educators in preparing prospective and practicing teachers to address the unique needs of students with disabilities? The old adage that, "We tend to teach the way we are taught," has particular significance for science methods' instructors and professors who teach science courses especially designed for future teachers. Circumstances and specific strategies for involving students from low incidence populations are often totally overlooked in the preparation of science teachers. A compounding problem is that although there is a great need for assistance when a student with a disability is in one's class, the occurrence is not frequent enough to remain current in the appropriate strategies. A third area of concern is that quality expertise is very limited and widely distributed.

Distance learning is an ideal technology to provide linkages between science for persons with disabilities' experts and classroom science teachers providing instruction to these students. First, providing additional instruction can help to alleviate deficits in preservice training programs for science teachers and/or special educators. Second, instruction can occur at a time when teachers face the dilemma of teaching science to students with disabilities, thus making the information and lessons more applicable. Finally, the use of interactive television to reach teachers can provide the desperately needed linkages between the science community, teacher educators, classroom teachers, and students with disabilities. However, research is needed to document the ability of technology, such as interactive television, to provide the type of teacher modeling and hands-on experience that would best benefit teachers and ultimately students with disabilities.

The need to provide inservice training to novice and expert science teachers who will have students with disabilities in their science classes and also to special educators who must teach science and/or collaborate with the regular education science teacher is well documented. What is not known are the most effective strategies. The purpose then of this project was two-fold. First, to develop and provide a collaborative hands-on science workshop along with basic information about disability conditions and how to adapt instruction for students with disabilities. Second, to study the use of the state-wide fiber optics network, the Iowa Communication Network (ICN), as a vehicle for delivering this training.

In collaboration with the Teacher Education Alliance Iowa Star Schools Project and by means of a workshop offered over the ICN, the following were goals of the project:

1. To present an overview on limitations of past practice in teaching science to students with disabilities and a need for change.

2. To present an overview on best practice, with specific attention to adaptations for students with orthopedic/motor (physical) impairments, visual impairments, hearing impairments, and learning disabilities.

3. To discuss adaptations and accommodations to enable maximum accessibility to science instruction by students with orthopedic/motor (physical) impairments, visual impairments, hearing impairments, and learning disabilities.

4. To provide participants with an actual hands-on science learning experience to increase their awareness of the need for instructional modifications for students with disabilities.

5. To engage in discussion and dialogue to address specific concerns related to students with disabilities in science classes, grades 5 - 8, in Iowa schools.

PROCEDURES

We designed a six-hour instructional sequence on science for persons with disabilities for teachers of students with orthopedic/motor (physical) impairments, visual impairments, hearing impairments, and learning disabilities and other interested educators. Three facilitators were identified in the Cedar Falls, Dubuque/Peosta, and Council Bluffs areas. A flyer was developed to advertise the workshop and each facilitator recruited five to six participants. The workshop originated from the University of Northern Iowa interactive television classroom. The Council Bluffs group was not able to participate because of previously scheduled inservice training associated with the beginning of a new school year.

Before the workshop, each site received a set of materials that included materials for the science investigation, print materials for the lesson, and assessment and evaluation materials.

After introduction of the workshop participants and presenters, the need for collaborative training in the area of science for persons with disabilities was presented. The workshop consisted of four parts: a) orthopedic/motor or physical impairments, b) visual impairments, c) hearing impairments, and d) learning disabilities. Each disability area was presented following a similar format. Initially, basic information was presented about the specific disability along with suggestions for adaptations. Next, the participants were given a simulated "impairment/disability" and were then required to conduct a simple scientific experiment. After the experiment ended, participants

Cameras

Throughout the workshop, the two presenters utilized several cameras. As mentioned earlier, the overhead camera was used to display textual information and show examples up close. The student camera at the distant site allowed the presenters and participants to view the activities going on there. Instructions were given to move the camera to allow the most inclusive picture possible. An additional demonstration camera was used at the origination site. This allowed us to broadcast a clearer picture (i.e., close-up) of the participants engaging in the hands-on activities. Participants at the distant site then had a model to follow as well as auditory directions.

PRINCIPLE OF PARTIAL PARTICIPATION	NOTES
Individuals with (severe) disabilities can acquire many skills that will allow them to function, at least in part, in a wide variety of least restrictive environments and activities. **The child should be allowed to participate in the activity even when:** **1. the child does not exhibit all the necessary prerequisite skills,** **2. the child will not be able to acquire all components of the skill,** **3. the child may not complete the entire activity or skill independently, and** **4. the child's developmental age is lower than his or her corresponding chronological age.** Types of adaptations: 1. Use materials and devices that make a skill easier. 2. Adapt skill sequences. 3. Use personal assistance. 4. Adapt rules. 5. Use social-attitudinal adaptations.	

Figure 1. An example of a note taking sheet.

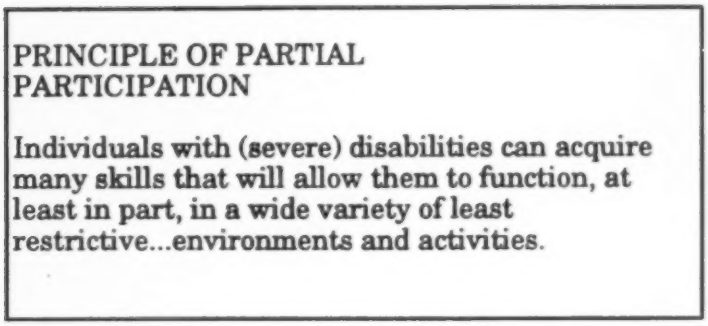
PRINCIPLE OF PARTIAL PARTICIPATION
Individuals with (severe) disabilities can acquire many skills that will allow them to function, at least in part, in a wide variety of least restrictive...environments and activities.

Figure 2. An example of an overhead in a 3" x 4" format suitable for the television screen.

Hands-on Activities

Three hands-on activities and a role play were utilized to simulate science activities that would be used as part of an upper elementary/middle school science curriculum. For each experiment, the participants were given instructions to simulate a specific disability condition. All the necessary materials were sent to the facilitators before the workshop.

The bouncing ball. The bouncing ball was a science experiment designed to teach students to make inferences and predictions by relating two variables. Participants were provided with a meter stick and five balls made from different materials (e.g., tennis ball, ping-pong ball, rubber ball). The participants taped popsicle sticks to the back to their knees, thumbs, insides of wrists, and sides of elbows to simulate an orthopedic impairment. The directions were to drop the ball from the top of the meter stick and record the height of the first bounce. Participants worked with a partner or in a group

and were allowed to develop adaptations (e. g., sitting on the floor, propping up the meter stick against the table) in order to complete the experiment.

Swingers. The experiment was designed to investigate variables that may affect the period of a pendulum. During this activity participants were blindfolded to simulate a visual impairment. Again, they worked in groups or with a partner. The materials were tactile. Various lengths of string were looped on one end and a washer was attached the other end. The loop in the string was slipped onto the index finger and participants were instructed to hold the washer and place the string at a 45° angle and then at a 90° angle. This was followed by changing washers, repeating the experiment, and then investigating the influences of the length of string. During a 5 second timing, they counted the number of swings. Afterwards, the strings were attached to the meter stick on the number of swings that would have occurred in 15 seconds. This created a tactile graph showing the relationship between length of string and number of swings.

The suffocating candle. This experiment was designed to provide students with skills in interpolation and extrapolation. It was implemented as if the students had a hearing impairment. No vocalizations occurred during the activity. Participants wrote their answers on paper and held them up for the teacher to see. The experiment involved placing a glass jar over a burning candle and timing the length of time before the candle extinguished itself.

Materials of the earth's crust. This science lesson covered the three types of rocks. Direct instruction was used during the role play to demonstrate a technique for presenting information to students with learning disabilities. The "teacher" told the "class" a fact: "There are three types of rocks." Next, a question was asked, "How many types of rocks are there?" A signal (i.e., snapping fingers) followed to which the class responded in unison (i.e., choral responding), "Three."

RESULTS

The results from this project have been divided into two sections. First, the results of a survey that was filled out by workshop participants are presented. Next, the evaluation data on the workshop are presented.

Survey

Six workshop participants returned questionnaires (see Appendix for a copy) sharing information about personal demographics, academic preparation, teacher training, and personal attitudes.

Demographics. Three respondents had special education certification, two had elementary education certification, and one had secondary science certification. During the 1993-94 academic year, two teachers teaching in a departmentalized setting had a mean of 120 students, the self-contained elementary teacher had a class of 24 students, and those teaching special education averaged 14 students. The group averaged 15.8 years of teaching experience.

The number of students served in classes during the 1993-94 school year were as follows. The teachers in regular classes served a mean of 3.3 students with physical or health impairments, a mean of .67 students with motor/orthopedic impairments, no students with visual or hearing impairments, a mean of 10.3 students with learning disabilities, a mean of

4.3 students with emotional/behavioral disabilities, and a mean of 3.6 students with mental retardation. The special education teachers served four students with hearing impairments, 15 students with learning disabilities, eight with emotional/behavioral disabilities, and four students with mental retardation.

Teacher training. All the teachers with special education preparation reported specialized training in learning disabilities, emotional/behavioral disabilities and mental retardation. However only one individual responding to the questionnaire had training in physical/health impairments, motor/orthopedic impairments and visual impairments. Two of the respondents reported training in hearing impairments. Five of the six respondents indicated they received some training in mainstreaming, three were exposed to inclusion, and two were acquainted with professional associations in the different disability areas. Only one received exposure to safety and legal concerns and none indicated that they were exposed to resources on teaching science to students with disabilities.

Only the teacher with special training in hearing impairments had observed or participated in a preservice science lesson that addressed adaptations for students with disabilities. None of the participants felt adequately prepared to teach science to students with physical or health impairments, motor/orthopedic impairments, visual impairments or hearing impairments. Two of the respondents felt adequately prepared to teach science to students with learning disabilities, emotional/behavioral disabilities or mental

retardation. In general those with training in special education felt adequately prepared in the selection, design and modification of activities and assessment and testing formats for students; however, none of the regular classroom teachers felt adequately prepared.

With regard to the amount of training that might be needed for themselves to teach science to students with disabilities, two of the six respondents felt a personal need for little training and four felt a need for some training. However, when indicating general needs for training to teach science to students with disabilities, all respondents felt that considerable training was needed for teachers at all levels, for methods' instructors, and for content area professors in higher education.

Attitudes. From a list of statements, respondents were asked to indicate yes if they agreed and no if they disagreed. All the respondents felt teachers need special training to overcome prejudices and emotional barriers in working with students with disabilities and that disability categories are too often used as an excuse for student failure. There was also total agreement that: a) special needs' students gain self-esteem and confidence by participating in science activities, b) outdoor field trips are excellent opportunities for increasing experiences of students with disabilities, c) all teachers of science should be required to participate in training to teach science to students with disabilities, d) all state and national conferences should have a section which includes programs on teaching science to students with disabilities, and e) all teachers should be receptive to

suggestions for making changes in the classroom and teaching methods to accommodate students with disabilities. None of the participants felt it was appropriate to conduct a science investigation with a student with disabilities as an observer and all felt that it was reasonable to expect science laboratories to be open extra hours to allow a student with disabilities extra time for laboratory investigations.

The respondents were split on whether a) primary responsibility for communication should rest with the special education teacher, b) care should be taken not to give students with disabilities unrealistic goal expectations that inevitably result in frustration when trying to find employment, and c) attention given to students with disabilities detracts from teaching other students. One respondent indicated that a) students with severe disabilities should not be included in science classes with regular students, b) students with disabilities are at-risk in science laboratories, c) students with disabilities increase the risk to other students in terms of science safety in science laboratories, d) the regular classroom teacher should not be expected to make adjustments in order to serve the special needs of students with disabilities, e) it is unfair to encourage a person with a severe motor/orthopedic impairment to pursue/study a career that involves active field study like marine biology or geology, and f) it is unrealistic to expect a blind student to be a chemist. Another respondent indicated that it is impossible to expect a student with a physical disability to be an active participant in science laboratory exercises and indicated a desire not to have to teach science to a student with a disability.

Video Close-ups: Sharing Methods with Iowa's Teachers

Manuscript for Iowa Distance Education Alliance Monograph

Final Report

by

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The purpose of this project was to identify all teacher education institutions in Iowa and create professional networking opportunities for them through the Iowa Communications Network. Specifically, this grant provided the funding to produce and disseminate model teaching videotapes and related printed materials to social studies methods instructors and secondary social studies teachers around the state of Iowa.

As of this date (August 30, 1994) we have identified all teacher education institutions in the state of Iowa and the individual that is responsible for teaching the social studies method course. Most of these professors have been contacted directly by phone to inform them of our plans. We are in the process of writing a letter of invitation for them to participate in the ICN broadcasts that have been scheduled for this Fall. We have actually scheduled six sessions on the ICN and once we know what works best for most of the participants, we will narrow that to four sessions as outlined in the grant. The dates are as follows: September 26, September 30, October 5, October 10, October 14, & October 19. The sites include the following: Iowa State University, University of Iowa (not available on Oct. 5th or Oct. 19th), Pella, Calmar (not available on Oct. 5th), Sioux City (not available on Oct. 5th), Waverly, & Drake.

The people who have been contacted are as follows:

Blair Cliff College
Dr. Edith
712-279-5473

Buena Vista College
Dr. Kline Capps
712-749-2275

Central College
Dr. Phillip George
515-628-5116

Coe College
Dr. Roger Johnson
319-399-8510

Cornell College
Richard Peters
319-895-4250

Dordt College
Dr. Martin Dekkenga
712-722-6258

Drake University
Dr. Unis Meradith
515-271-3911

Grand View College
Ron Zigler
515-263-2868

Iowa State University
Dr. Clare Keller
515-294-3594
Luther College
Ed Epperly
319-387-1540

Maharishi International University
Chris Jones
515-472-1105

Teikjo Westmar University
Dr. Carol Lunge
712-546-2003

University of Iowa
Meg Rogers
319-335-5355

Wartburg College
Kevin Fiene
319-352-8200

In terms of the 3 videotapes, the footage has been collected and edited to rough cuts. We are now in the process of refining each segment and will complete the editing process on September 6th & 13th. Steve Giannoble is serving as our student assistant that is responsible for the editing process. To save money, we elected to edit the tapes at the Area 7 Education Agency in Cedar Falls where there is no charge for the editing system.

Our presentation about this grant has been accepted at the National Council of Social Studies national conference in Phoenix, Arizona on November 20, 1994.

We will begin the design of the informational brochure within the next few weeks and will disseminate those along with the videotapes at the conclusion of the four ICN broadcasts.

A survey will be developed to assess the strengths and weaknesses of the ICN broadcasts.

Curriculum Visions: Integrating The Connecting Fiber

Teaching is both an art and a science. It is critical that teachers have a command of the knowledge of the content being taught. It is also essential that teachers engage their students in the learning process. It is by knowing the information to be taught, understanding the elements of good pedagogy, and realizing the individual differences of their students that teachers are effective in their craft.

Since the advent of formalized education, teachers have been using an array of teaching materials and equipment to help them facilitate learning. These tools of the trade have included such devices as the blackboard and chalk, overhead projectors and transparencies, and more recently computers and software. With the introduction of advanced technologies, it is now possible for teachers and students to reach beyond the confines of the four walls of their classrooms.

Computer-based telecommunications is one such technology for extending the classroom. By using telephone lines and computers with modems teachers and students have been able to reach out to other resources across the country. Data transfer has been ongoing in education for years. This form of telecommunications has created a whole new way of examining the teaching and learning process. Teachers and students are no longer limited to their own knowledge

base, nor to the available resources in their schools. It is now possible for teachers and students to link themselves with experts, database resources, and online communications. Networking systems open up possibilities for new avenues of learning and extending horizons.

But, advances in technology have not stopped there. With the advent of fiber optics and satellites, telecommunications have taken on a new format. Data, voice, and live-action video are available to classrooms throughout the world. It is possible now for educators and students to network in new ways with others in both classroom and extracurricular activities.

One cannot examine this technology without also examining the approaches teachers must incorporate to make it an effective learning tool. As with previous technologies, teachers and students must examine the nuances of this technology in order to insure they are both using it effectively and efficiently. The challenges of helping both preservice and inservice teachers to use technology remain large. For example, progress in the use of computer related technologies has been slow and tedious. According to Becker (1991) even by 1990 a minority of teachers were considered to be computer users.

Learning to use the telecommunications networking devices requires training for both the teachers and students. The focus of the

December, 1992, issue of the Kappan identified the importance of teachers understanding the operation of the technology, the impact of the training process, and the necessity of prior practice to its use in the classroom. The fiber optics and satellite telecommunications equipment are new devices that teachers have not used before. There are constraints imposed by these tools. Teachers know they must learn to adjust their teaching styles in order to be certain learning takes place.

Teachers have stated the need to learn the techniques that will enhance their teaching and to insure they are being effective in the utilization of the technology. This need is not limited to those who are already experienced teachers. Teacher education majors, those who are preparing to become classroom teachers, must also have experiences with the technology prior to their engaging in their chosen profession. For many this is not an experience they have had as a student prior to college. For those who might have had an opportunity to take a course at a distance, it is not enough to expect they can move to the other side of the desk and become a practiced teacher using the technology.

Reynolds (1992) suggests that there are a number of expectations of teachers entering their first year of teaching. Such considerations as content knowledge; understanding the students; knowing strategies,

techniques, and tools for creating and sustaining a learning community; good teaching practices; and the ability to reflect on their teaching are critical for the beginning teacher. Acquiring these skills requires preservice courses that address the various areas. If teacher educators are to produce beginning teachers prepared to teach effectively using distance education technology, they must make distance education an integral part of the preservice experience (Brooks & Kopp, 1990).

Preservice teachers need to see the technologies being used confidently by faculty. Modeling will announce the value of the technological applications in the classrooms. Schrum (1991) suggests that incorporating technology into teacher education and professional development activities, provides educators with the time needed to gain confidence, identify appropriate uses, and experiment with specific techniques for classrooms. She adds that technologies provide an opportunity for educators to become familiar with interactive media in natural and comfortable settings in which the equipment becomes almost invisible within the learning experience. The state of Iowa reinforces this concept of the need for training in the use of distance education technology by stating that distance teachers shall receive instruction regarding effective practices which enhance learning by telecommunications before delivering instruction via telecommunications.

Without training in distance education as part of their preparation for teaching, future educators will be handicapped in their field. If first year teachers are expected to be creative and skilled with technology, they deserve exposure to technological enhancements at all levels of the preservice curriculum. Improved entry-year competence with technological enhancements begins with faculty modeling the technology within the preservice curriculum. It is through incorporating experiences in using the technology as students that teacher education majors will be prepared to enter the classroom ready to embark on new adventures in teaching.

What follows within this section are vision statements developed by teacher education experts in the fields of foreign language, literacy, mathematics, science, and vocational education. They serve as perspectives concerning the application of distance education methods to these disciplines. The authors of these statements are members of the Iowa Star Schools Education Alliance:

Foreign Language:	Michael Fast (University of Iowa)
	Leslie Schrier (University of Iowa)
Literacy:	Mary Bozik (Univ. of Northern Iowa)
	Donna Merkley (Iowa State Univ.)
	Kathy Oakland (Univ. of Northern Iowa)
Mathematics:	Gina Foletta (University of Iowa)
	Harold Schoen (University of Iowa)
Science:	Lynn Glass (Iowa State University)
	Robert Yager (University of Iowa)
Vocational Education:	Wade Miller (Iowa State University)
	Margaret Torrie (Iowa State University)

References

Becker, H. (1991). Computers in United States schools: 1989 survey. Journal of Educational Computing Research, 7(40, 407-420.

Brooks, D. & Kopp, T. (1990). Technology and teacher education. In W.R. Houston (ed.) Handbook of research on teacher education. (pp. 498-513). New York: Macmillan.

Reynolds, A. (1992). What is competent beginning teaching? A review of literature. Review of Educational Research, 62(1), 1-35.

Schrum, L. (1991). Teacher education goes on-line. Educational Leadership, 49(3), 39-42.

Foreign Language

Michael Fast

Leslie Schrier

Introductory Statement

Foreign and Second Language Education derives its theoretical base from various autonomous disciplines, principally Education, Second Language Acquisition, Linguistics, Applied Linguistics, Psycholinguistics, Sociolinguistics, as well as the specific culture and language domains themselves. And in some circles it is considered the pedagogical wing of Applied Linguistics. In a world increasingly conscious of the need to exploit international communication for political, commercial, and cultural ends, foreign and second language education assumes a crucial role. This is more than apparent in the profession's broadening interest within mainstream education in the so-called "critical languages" like Chinese, Japanese, and Russian, while still maintaining strong emphasis on the more commonly taught languages like French, German, and Spanish.

Foundations

Within the last twenty years the knowledge base of foreign language education in our nation has multiplied considerably. The direct cause of this explosion of scholarship in the discipline can be traced to the

newly established research fields of Second Language Acquisition and Applied Linguistics. Strength through wisdom: A critique of U.S. capability (1979) offered written testimony to the emerging preoccupations for national recognition of the importance of foreign languages and implicitly suggested the need for an autonomous research base. The fields of Second Language Acquisition and Applied Linguistics owe considerable debt to researchers in the area of English as a Second Language (ESL). These scholars were the first to question what it means to learn a second or foreign language (L2) and hence how its pedagogy should be influenced. Research in L2 acquisition has been so influential that its development in the 70's marks a clear break with the behaviorist approaches to language learning that were in practice in this country up to this point. When the Presidential Commission for Foreign Language and International Studies published its strategically significant report entitled Strength through wisdom the language teaching profession was forced into much introspection. In this report the foreign language education profession was highly criticized for its inability to teach the spoken language more efficiently and effectively. The report implied that because our nation's youth lacked proficiency in foreign languages and cultures, especially those defined as critical to the nation's economy (Chinese, Japanese, Russian, and Spanish) we were becoming less competitive in the world's marketplace.

State of the Curriculum Movement

Communicative proficiency became the code word for everything related to L2 instruction. This term was operationalized by the profession's main organization, the American Council on the Teaching of Foreign Languages (ACTFL), with the publication of the Proficiency Guidelines (1986). ACTFL inundated the L2 teaching profession with workshops, materials, and most importantly, the ACTFL oral proficiency interview. This proficiency examination served as a metric for evaluating everything related to language instruction from individual achievement to foreign language curricula at all levels of instruction. The framework that supports the ACTFL evaluation instruments looks at language learning and teaching in hierarchical manner. The Guidelines separate language learning into five modalities: listening, reading, speaking, writing, and culture. Each of the modalities in turn is described with a linear methodology for learning and teaching. The ACTFL Proficiency Guidelines have not been without its critics; in fact their very existence has generated an entire body of research. Critics of The Guidelines (e.g., Allen, Bernhardt, et al. (1988), Lee & Musumeci (1988), and Schrier (1990)) established that ACTFL generated these metrics without any underlying theoretical assumptions of the process of language acquisition or a data base on the state of language pedagogical preparation. Nonetheless, these Guidelines influenced nearly twelve

years of material development, pedagogical innovations, and evaluation of language proficiency.

In the 90's, the ACTFL is in the process of collaborating with both its critics and its general membership in developing an overall framework that looks at the development of language learning. The learner-centered approach is used effectively in Australia, Europe, and South America as a basis for many successful L2 curricula (e.g., Nunan, 1989). This approach requires a greater amount of collaboration between and among L2 researchers, teachers, learners, policy makers and funding agencies than has previously occurred.

Visions of Distance Education

Distance education suggests a special challenge for foreign language instruction. Foreign language educators and specialists need to examine ways in which the prevalent communicative trends in methodology and learner-centered focus on curriculum development can be applied to the complex context of multi-site teaching. This type of instructional context depends to a considerable extent on technology for its transmission; we thus need to examine ways in which we can instantaneously access and disseminate various sources of multimedia information from site to site to promote the type of interactive teaching and learning that has become a large part of the profession. Providing

Iowa foreign language teachers with examples, explanations, and access to technological as well as more traditional resources to help them develop a learner-centered curriculum should be a goal of the Teacher Education Alliance.

References

ACTFL Proficiency Guidelines. (1986) Hasting-On Hudson, New York: American Council on the Teaching of Foreign Language.

Allen, E.D. & Bernhardt, E.B. (1988) Comprehension and text genre: An analysis of secondary school foreign language readers. Modern Language Journal, 72 (2): 163-172.

Lee, J.F. & Musumeci, D. (1988) On hierarchies of reading skills and text types. The Modern Language Journal, 72(2): 173-187.

Nunan, D. (1989) The learner-centered curriculum. New York: Cambridge University Press.

President's Commission on Foreign Language and International Studies. Strength through wisdom: A critique of U.S. capability. Washington, D.C.: U.S. Government Printing Office, November 1979.

Schrier, L.L. (1990) The effects of the foreign language curriculum on the development of language teachers in the United States. In C. Kramsch & S. McConnell-Ginet (Eds.), Text and context: Cross-Disciplinary Perspectives on Language Study, (pp.251-266). Lexington: D.C. Heath.

Literacy

Mary Bozik

Donna Merkley

Kathy Oakland

Introductory Statement

The Guide to Curriculum Development in Language Arts by the Iowa Department of Education (1987) states that,..."through language, individuals are able to interact with others, sharing thoughts, feelings, and experiences." Language learning affects the entire learning field, and in today's information-based society, students must be capable of high-level critical thinking, creative problem-solving, and effective written / oral communication. Broad-based literacy is a prerequisite for effective functioning of our democratic institutions as well as for full participation in a modern technological world.

Foundations

Literacy combines basic disciplines of reading, writing and oral communication. A literacy curriculum must be based upon the best research and the most current knowledge from the areas of literature, composition, reading and oral communication as well as upon research on the most effective ways to integrate these areas in order to enable learners to carry out the complex communication tasks demanded by

modern society. According to the Guidelines for Developing Oral Communication Curricula in Kindergarten through Twelfth Grade (Speech Communication Association, 1991) , "The integrated language arts curriculum remains only an ideal. The actual development of interdisciplinary goals and standards, the merger of theoretical and functional objectives across the disciplines, the adequate training of teachers to participate in such programs, and the creation of appropriate learning contexts, all may delay the creation of integrated language arts curricula."

Typically, textbooks have dominated the literacy curriculum, and critics question the control that textbook publishers exert over what teachers teach and what learners learn. One response to this criticism is the growing momentum of the "whole language" movement . The assumptions underlying whole language include the views that: 1) the child's language is the basis for all reading instruction; 2) Language is used primarily for communication and meaning is central to all language development; 3) speaking, reading writing and listening are interrelated; 4) writing is a central component to literacy learning; 5) skill instruction is presented not through isolated drills, but within the context of the material being read. Whole language began as a "bottom up" innovation, with individual teachers initiating implementation on their own. On one level, it is a movement about empowerment---about who makes decisions and on what basis

(Hoffman, 1992). On another level, it represents an integrated view of literacy, literacy learning and teaching that is driven by key assumptions about how students learn. Classroom teachers at all levels are reflecting on their classroom teaching and assessment practices with regard to the empowerment and with regard to the demands of an integrated view of literacy. This reflection heightens the need for well-planned, effectively delivered staff development programs as well as carefully designed research studies in response to the numerous critics of "whole language." The role of phonics, the practice of grouping for instruction, and the form and content of reading and writing assessment are central in the "whole language" debate.

Special issues are presented at different levels of literacy development. Children differ in the personal literacy histories they bring to school, and families differ in the resources they have to promote the educational well-being of their children. If teachers want to personalize instruction, engage children, and make them feel valued, these differences must guide what teachers do and say in their interactions with children. Failure in literacy learning during the first years of school can limit all school achievement. There is evidence that virtually all children can learn to read and write, and the need for improving the skills of low-income and minority students remains particularly acute. Programs designed to provide all children with

access to sufficiently intense, personal and high-quality instruction requires a redistribution of funding now available for programs that are intended to address the difficulties that some children face when learning to read.

State of the Curriculum Movement

Since literacy involves complex processes, and since the range of variability among students increases with each passing school year, middle grade teachers need to know the gamut of reading development. In addition, shifts occur within a student as he or she shifts genre and topic. Typically middle school teachers work in a least five environments. Each environment, or class period, couples unique social dynamics of the students with the individual reading variations, requiring the responsive teacher to make subtle or gross changes within a day in order to manage these environmental variations. Middle school teachers are challenged to maximize opportunities to read in an instructionally supportive environment, and to instruct middle-grade students in motivating, interesting , and developmentally appropriate ways. In part, this requires that the teacher identify and teach the reading strategies that are needed by the specific students, while at the same time incorporating collaborative grouping in order to capitalize on middle students' social, peer-oriented frame of mind. Reading instruction warrants authenticity while at the same time

guiding the students to perceive the relevance of it all for their reading improvement. As teachers strive to meet the instructional needs of young adolescents, they address the need for improvement in at least five areas of instruction: mode of presentation, instructional format, use of textbooks and materials, nature of classroom activities, and questioning, critical thinking and problem solving (Wood and Muth, 1992).

Special Issues for high school (grades 9-12) center around addressing the literacy needs of at-risk students, extending and refining the skills of all students while promoting lifelong literacy habits. Adult illiteracy limits personal, social, and economic growth; the quality of school programs can swell or reduce the numbers of adult illiterates.

English, the last of the major subjects to develop standards, began a national standards project in September of 1992. The project consists of five overlapping phases over the course of three years and includes representation from the International Reading Association, the Center for the Study of Reading, and the National Council of Teachers of English The standards will be designed to define the common core of what is valued in the teaching and learning of English. It is projected that the standards will avoid prescribing a single method for attaining excellence but will set forth a dynamic framework that local schools

and communities can adapt to meet their unique needs, evolving as needs emerge and change.

A number of significant issues face the committees as standards are developed. These include: 1)The role of phonics, 2) the role of bilingual education. 3) the value of recommended reading lists, 4) the form and content of assessment. Special attention is being given to curtailing specific misuses and misinterpretations of standardized tests, improving existing tests, and proposing alternative assessment procedures (*performance, projects and portfolios)* that place standardized test scores in a broader context or begin to substitute for them. 5) the development of standards that treat all students equitably, 6) the issues of equity of delivery (*class loads, books, planning time, staff development).* 7) the consideration of the roles of language arts and English in the overall curriculum as curriculum becomes less organized around subject areas and more concerned with the needs of individual learners.

Visions of Distance Education

Distance education can provide the technology to:

1. support the above
2. demonstrate teaching / evaluation
3. support networking (student-student, teacher-teacher, schools-community)
4. pilot course transmission

MATHEMATICS

Gina Foletta
Hal Schoen

Foundations

One of the basic assumptions of the National Council of Teachers of Mathematics (NCTM) Professional Standards For Teaching Mathematics is, "learning to teach is a process of integration ... The final success for any teacher is the integration of theory and practice ... Teachers should be able to comment and reflect on their own learning environments at the same time they are involved in clinical and field-based teaching experiences" (1991d, p 124). The Teaching Standards recommend a shift toward classrooms as mathematical communities.

Two coordinated curriculum reports, The National Council of Teachers of Mathematics' (NCTM, 1989) Curriculum and Evaluation Standards for School Mathematics and the National Research Council's (NRC, 1989) Everybody Counts, mark the beginning of the current reform efforts in mathematics education. Both question basic goals and values found in current instructional practices. Everybody Counts documents the current state of affairs in mathematics education, states the need for changes, and proposes a plan of action. The Standards outline a vision for mathematics curricula and assessment. This vision reflects the consensus of the mathematics education community that "all

students need to learn more, and often different, mathematics and that instruction in mathematics must be significantly revised" (NCTM, 1989, p.1).

State of the Curriculum Movement

The Mathematical Sciences Education Board's (MSEB,1990) Reshaping School Mathematics: A Philosophy and Framework for Curriculum focuses on two issues similar to those considered by the NRC and NCTM. The Board calls for changing perspectives on (1) the need for, nature and learning of mathematics and (2) the role of calculators and computers in the teaching of mathematics.

These issues, put forth by NCTM, NRC and MSEB, imply a paradigm shift in how mathematics education is viewed:

- From a dualistic to a singular focus on a common core of mathematics for all students in a technological society,
- From a teacher-centered to a student-centered classroom,
- From knowledge as telling to knowledge as constructed,
- From learning as a static activity to learning as active,
- From a procedural emphasis to conceptual emphasis that takes full advantage of technology, and
- From doing exercises to solving problems.

The Professional Standards for Teaching Mathematics (NCTM, 1991), a companion document to the Curriculum and Evaluation Standards, identifies the practicing teacher as key to the kind of instruction needed to implement the Curriculum and Evaluation Standards for School Mathematics. This mathematics reform requires changes in curriculum and materials, modes of assessment, teaching strategies and professional development.

The publishing of several of the books from the Curriculum and Evaluation Standards for School Mathematics Addenda Series and the Mathematics Assessment: Myths, Models, and Practical Suggestions book typify NCTM's efforts to address some of these areas. The Mathematical Sciences Education Board is working to create a board in each state to help implement the Standards. Also a joint project sponsored in part by NCTM and MSEB is "leading mathematics education into the 21st century."

"The kind of instruction needed to implement the NCTM Standards requires a high degree of individual responsibility, authority, and autonomy -- in short, professionalism on the part of each teacher" (NCTM, 1991d, p.4). "As professionals who must keep up with a rapidly changing and technically complex field, mathematics teachers especially need time and opportunity to read, to reflect, to plan, and to exchange ideas with other mathematics teachers" (MSEB, 1990, p.49).

Visions of Distance Education

How can teachers foster mathematical communities in the classroom if they themselves do not feel part of the community of mathematics educators? This sense of isolation is common place among mathematics teachers but is especially true for those in more remote rural areas of Iowa. Isolated teachers are often trapped in a repetitive cycle -- teaching like they were taught, which was usually in similar environments. What kinds of environments are needed to break the cycle? How can we help the teachers move from being solitary educators toward a more communal, reflective stance about their own teaching activity? The networking provided by the Iowa Star Schools Project can be the catalyst to help mathematics teachers move out of this sense of isolation and into a life-long process of professional development.

First and foremost among the needed activities is how to deliver instruction over the network; especially with the management of cooperative learning activities that may or may not include the use of technology. Other areas particular to mathematics instruction include alternative assessment and the teaching of communication and reasoning. Diversifying mathematics assessment can have the potential of improving instruction and students' learning. Teachers

can begin to view almost any activity as an opportunity for assessment. At the same time, as students become more reflective, they are better able to self-assess their own activities. Inherent in each activity are the ability to reason and communicate effectively. This can be observed by assessing the students through writing, class or small-group discussion, and the effective use of technology.

In the live classroom, dialogical and dialectical thinking occur through the interaction of teacher to students and student to student (Klinger & Connet, 1992). To be effective, distance learning must also include a strong element of interaction. The instructor needs to rethink the presentation of the course content with some type of creative structuring in mind. In other words, quality pre-planning is necessary. Students will need to make certain comparisons that normally result from classroom interaction. This can be done by adding a unit enabling students to make these connections. The type of critical thinking that can happen in distance classrooms will only serve to enhance the communication and connection skills proposed by the NCTM Standards.

Iowa is a rural state in which 76 percent of its districts enroll less than 1,000 students. These districts serve about one third of Iowa's total population and are located in areas without nearby large population centers. Because of smaller student populations and economic

restraints, it is difficult for small districts to offer a full array of courses. In mathematics, students in districts of less than 1,000 students on average were offered 7 units of mathematics during 1990-91. In contrast, students in larger districts had access to 13 units. Distance education by way of the Star Schools Project is one response to this problem. Randall (1991) reports that distance education is effective for preparing students in advanced mathematics and advanced placement courses. Student preparation, in rural areas, for college is enhanced. Also, the study indicates no significant difference between learning in a traditional classroom and learning in their telecommunications projects.

Distance education by way of the Star Schools project provides Iowa mathematics teachers with a unique opportunity to be on the cutting-edge of education. The technology need not hinder the achievement of present curricular objectives, but may enhance them. The challenge is to emphasize the power of mathematics within the context of student-centered classrooms.

References

Klinger, T. H., & Connet, M. R. (1992). Designing distance learning courses for critical thinking. In T.H.E. Journal, 20, 3, 87-90.

Mathematical Sciences Education Board. (1990). Reshaping school mathematics: A philosophy and framework for curriculum. Washington, DC: National Academy Press.

National Council of Teachers of Mathematics. (1989). Curriculum and evaluation standards for school mathematics. Reston, VA: National Council of Teachers of Mathematics.

_____ (1991a). Curriculum and evaluation standards for school mathematics addenda series, grades 5-8. Frances R. Curcio (ed.). Reston, Va.: The Council.

_____ (1991b). Curriculum and evaluation standards for school mathematics addenda series, grades 9-12. Christian R. Hirsch (ed.). Reston, Va.: The Council.

_____ (1991c). Mathematics assessment: Myths, models, and practical suggestions. Jean Kerr Stenmark (ed.). Reston, Va.: The Council.

_____. (1991d). Professional standards for teaching mathematics. Reston, Va.: The Council.

National Research Council. (1989). Everybody counts: A report to the nation on the future of mathematics education. Washington, DC: National Academy Press.

Randall, R. E. (1991). Trio of telecommunications projects are paradigms for rural education. T.H.E. Journal, 18, 10, 71-72.

Science

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Introductory Statement

National Standards in Science are being developed involving many national leaders. The debates occurring as the Standards emerge represent the current debate and the likely direction for school science and the Iowa STAR Schools Project. So far the effort is centered upon various domains of science, including Fundamentals of Science, Processes of Science, Applications of Science, Contexts of Science, but all the work to date has focused only on the basic concepts and processes of science--most emerging from the national efforts of the 60s (AAAS, 1963; National Committee on Science Education Standards and Assessment, 1993).

Foundations

Science has been discipline oriented--often with competition among biology, chemistry, and physics teachers for places in the curriculum and for attracting the most able students. In the high school science is seen as a college preparatory sequence--this justification growing in prominence after Harvard University identified physics as a requirement for admission in 1821.

The profession seems united today in pursuing the importance of science/technology for all students each day of each year during the 13 year K - 12 program in the 16,000 U.S. school districts (Voelker, 1982). Most agree that we have failed with the most gifted--even those pursuing science majors in colleges and universities. Studies conducted during the last ten years have revealed that up to 90% of Physics and engineering students studying at the most prestigious universities can not use the information and skills they seem to know and can use in following directions and mimicking classroom and laboratory procedures (Champagne & Klopfer, 1984; Mestre & Lochhead, 1990). In studying why the failure for the best and most interested, it has become apparent that all persons really learn by/through constructing meaning for themselves (von Glasersfeld, 1987,1988). The contrived situations, the "cook book" directions, the "learn the words and skills in isolation and you can use them on your own later" are approaches which must be abandoned.

State of the Curriculum Movement

Current thinking in science education focuses upon the context for learning science (Yager, 1991). The context is assuming a position of prominence--more important than the old concept-process debate (Mestre & Lochhead, 1990). During the 60s we were focusing upon the identification of the unifying concepts of the various sciences and the skills scientists use in developing such concepts (usually called science process skills). All the alphabet programs of the 60s and early 70s were attempts to develop materials (often described as teacher proof) which would include the essential science concepts and processes needed by all persons to achieve scientific/technological literacy by the time of high school graduation (Harms, 1977). Mastery of these concepts and skills in the absence of any real world context contributed to the failures of our grand national experiment and expenditure of two billion dollars in the 25 years following Sputnik.

Today most science educators recognize the importance of:

1. Abandoning the discipline format of the typical curriculum (This means moving to the integration of the sciences and includes a focus upon technology as well as basic science.);
2. Organizing learning around real world questions and problems (This means providing a real context/situation and ensuring that basic

concepts and processes are needed--not just school and teacher promise that they will be needed and useful later.);

3. Placing the student in a central position as the curriculum evolves and instruction is planned (This means that a curriculum can not be planned--perhaps even the specifics of a daily plan--without input and work on the part of the students.);

4. Dealing with local and current issues (This means use of periodicals, local experts, current problems; it means that the curriculum cannot be pre-packaged around a single textbook and 180 teacher constructed lesson plans.); and

5. Collaboration and cooperation as essential ingredients as problems are identified and used as a focus for study. (This indicates a new role for teachers--a role that many teachers feel unprepared to assume.)

Visions of Distance Education

To reform science education will require time, energy, commitment, and resources. The task will not be easy. However, the urgency of the problems in today's world demands immediate attention in every school in Iowa. Distance learning may will be the most effective way of involving significant numbers of schools and teachers.

One of the greatest change agents is the power that comes from examples of practices that produce the reforms for which we yearn. We can offer verbal descriptions--but these are far less effective than seeing successful teachers and students in classrooms where new organizers, instructional strategies, and assessment modules are in practice.

Suddenly we have the potential to reach every student and every science teacher in Iowa with a philosophy and example of reforms. In addition, we can define results and research evidence to help all share in the visions of reform and specific ways of making the visions a reality. The Distance Learning possibilities are endless--always encouraging collaboration and real learning while extending and altering our original visions as we gain more knowledge and experience with the needed reforms.

The changes in science education in 1993 require that we prepare science teachers differently and that we enter into a massive inservice program. All teachers will be vital partners in this renewal. Just as students learn from constructing their own meaning--so will new and practicing science teachers need to see the problems and enter into efforts to resolve them.

References

American Association for the Advancement of Science. (1963). Science--A process approach. Washington, DC: Ginn & Co.

Champagne, A.B., & Klopfer, L.E. (1984) Research in science education: The cognitive psychology perspective. In D. Holdzkom & P.B. Lutz, (Ed.), Research within reach: Science education (pp. 171-189). Charleston, WV: Research and Development Interpretation Service, Appalachia Education Laboratory.

Harms, N.C. (1977) Project Synthesis: An interpretative consolidation of research identifying needs in natural science education. (A proposal prepared for the National Science Foundation.) Boulder, CO: University of Colorado.

Mestre, J.P., & Lochhead, J. (1990). Academic preparation in science: Teaching for transition from high school to college. New York, NY: College Entrance Examination Board.

National Committee on Science Education Standards and Assessment. (1993). National science education standards: An enhanced sampler. Washington, DC: National Research Council.

Voelker, A.M. (1982). The development of an attentive public for science: Implications for science teaching. In R.E. Yager (Ed.), What Research Says to the Science Teacher, (Vol. 4) (pp. 65-79). Washington, DC: National Science Teachers Association.

von Glasersfeld, E. (1987). The construction of knowledge. Seaside, CA: The Systems Inquiry Series, Intersystems Publication.

von Glaserfeld, E. (1988). Cognition, construction of knowledge, and teaching. Washington, DC: National Science Foundation.

Yager, R.E. (1991). The constructivist learning model: Towards real reform in science education. The Science Teacher, 58(6), 52-57.

Vocational Education

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Introductory Statement

Vocational education is strongly influenced by federal and state legislation mandating parameters and content. The federal mission of Vocational Education is defined by Carl D. Perkins Vocational and Applied Technology Act of 1990 is as follows: "Organized educational programs offering a sequence of courses which are directly related to the preparation of individuals in paid or unpaid employment in current or emerging occupations requiring other than a baccalaureate or advanced degree." Such programs shall include competency based applied learning that contributes to an individual's academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, and the occupation-specific skills necessary for economic independence as a productive and contributing member of society.

Foundations

Iowa legislation, (Senate File 449) effective July 1992, provides for equal access to a diversity of quality programs by specifying program characteristics, minimum requirements, competencies, evaluation, regional planning, composition and duties of regional and merged boards, five-year planning. Further, Iowa requires vocational education programs for 7th and 8th grade students in addition to programs designed for high school and adult learners. Although vocational education programs have included programming for handicapped/special needs students since the mid-1970s, an intense effort is now underway to assess the inclusion of courses designed for handicapped students at community colleges and area vocational-technical schools.

State of the Curriculum Movement

Vocational Education discipline titles vary from state to state. However, they are commonly referred to as agricultural education, business education, home economics (consumer and homemaking, and occupational), distributive education, technical education, and trade and industrial education. Instructional approaches include supervised work-study/cooperative education, in-class/laboratory instruction, correspondence education, and competency-based

performance testing. Instructional settings vary to include the comprehensive secondary school, alternative high schools, home study, and industrial or community/business work sites.

Vocational educators historically maintained differences from general educators because of the need to focus on vocational and avocational skill acquisition, and manipulative skills that are immediately relevant to learners. That is, concrete supersedes abstract learning in most situations and hands-on, applied learning is their preferred model. Typically, vocational teachers not only undergo preservice academic experiences, but also have work experiences to support the discipline. Teacher education programs in vocational education encourage this type of student experiential base.

Visions of Distance Education

Distance education methodology is relatively unknown as an approach to providing vocational teacher education courses. It is anticipated that successful delivery depends upon the adaptability of the technology to the aforementioned teaching/learning styles. to this end, the challenge for vocational educators is to identify effective and successful strategies or "a synthesis of best

practices." Once these strategies are clarified, appropriate vocational curriculum methodologies can be written.

More generally, distance education technologies can be used as a cost-effective means to providing information to support the implementation of the Standards for Vocational Education in Iowa (Senate File 449).

References

Butzin, S.M. "Integrating Technology into the Classroom: Lessons from the Project CHILD Experience." Phi Delta Kappan December, 1992. pp. 330-33.

Foran, J., D.Pucel, R.Fruehling, and J.Johnson. Effective Curriculum Planning Paradigm Publishing Int., 1992.

Hudelson, D. "Roots of Reform." and selected other articles in Vocational Education Journal October, 1992.

Iowa Department of Education. A New Vision for Vocational-Technical Education in Iowa February, 1992.

Iowa Department of Education. Highlights of S.F.449 September, 1989.

Iowa Department of Education, Iowa Needs Assessment for Vocational Education Supplemental, June, 1992.

National Commission on Secondary Vocational. The Unfinished Agenda: The role of vocational education in high school. Columbus: The Ohio State University. 1984.

Naylor, M. Granting academic credit for vocational education Columbus, OH: ERIC No. ED 275887. 1986.

Wilcox, J. "The Perkins Act." Vocational Education Journal February, 1991. pp. 16-17.

Wirth, A. "Education and Work: The Choices We Face." and other selected articles in Phi Delta Kappan January, 1993. pp. 361-6.